

Sysmac Library for NJ/NX/NY Controller

SYSMAC-XR008

# Device Operation Monitor Library



✓ Prevent equipment from stopping suddenly and increase operating efficiency.

**Issue 1** It is required to detect errors of devices before the errors cause intermittent stoppages of equipment.

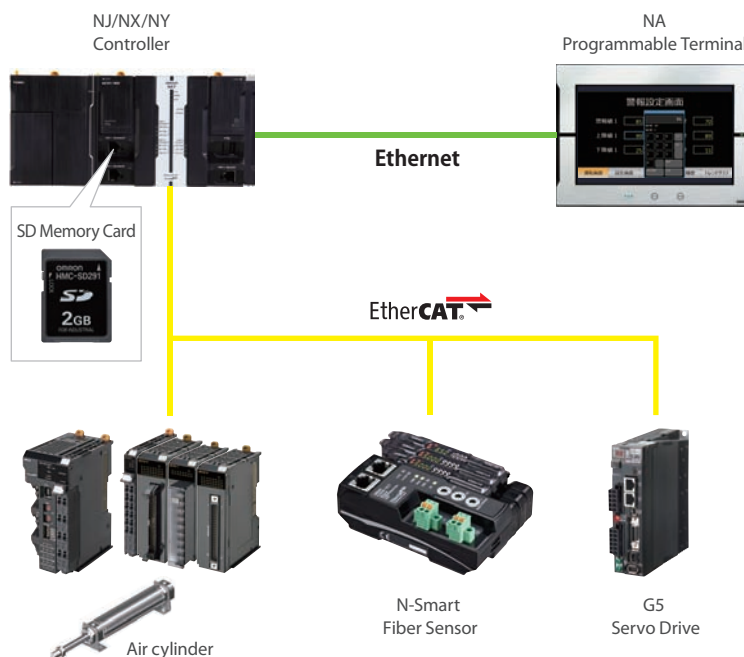
**Issue 2** When an error occurs in equipment, both quick recovery and identification and solution of problems are required.

## Device Operation Monitor Library offers solution!

You can easily monitor air cylinders, sensors, and servo drives/servomotors that often cause intermittent stoppages. Detecting deterioration over time or errors of devices prevents machines from stopping suddenly in advance, improving operating efficiency.

The status of devices before and after the occurrence of an error can be stored on an SD memory card. This allows you to identify the cause of the error after the equipment is restarted.

### System configuration



The status of each device can be displayed as alarms. Trend graphs that visualize the status of devices allow you to check the maintenance time.

#### Air cylinder

Monitoring cylinder operation time  
Detects an error if cylinder positioning operation is not completed during the specified period after the startup signal of the solenoid valve is turned ON.

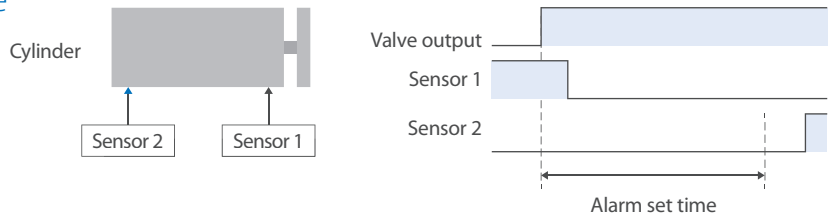
#### N-Smart E3NX Fiber Sensor

Monitoring light intensity  
Detects dirt or deterioration of the sensor and outputs a warning if the incident light level drops.

#### G5 Servo Drive/Servomotor

Monitoring torque of servomotor  
Monitors whether the actual torque of the servomotor is within the normal torque range.

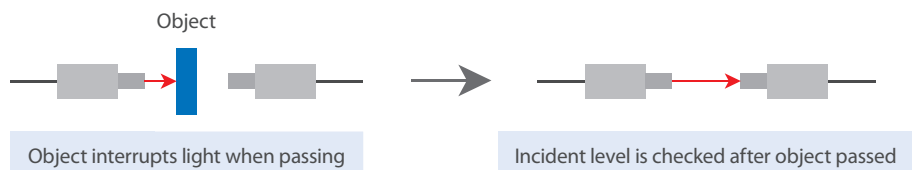
## Monitoring cylinder operation time



✔ Operation not completed within the set time  
→ Cylinder deterioration

The operation time becomes shorter or longer due to deterioration of the cylinder. Deterioration of the cylinder is detected by monitoring the cylinder operation time and comparing it with the normal operation time. Thanks to fast EtherCAT communications, operation time can be measured accurately.

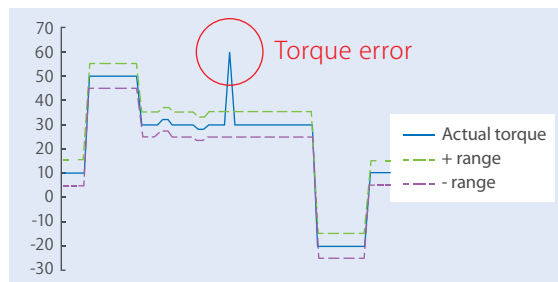
## Monitoring light intensity after light is interrupted



✔ Incident level below a threshold  
→ Dirty or deteriorated sensor

The incident light level drops due to dirt or deterioration of the sensor. Errors such as dirt and deterioration are detected by monitoring the incident light level after an object passed.

## Monitoring torque of servomotor



✔ Torque error  
→ Mechanical deterioration

Deterioration of the servomotor and mechanical errors reduce or increase the torque. Deterioration and other errors are detected by monitoring the torque and comparing it with the normal torque.

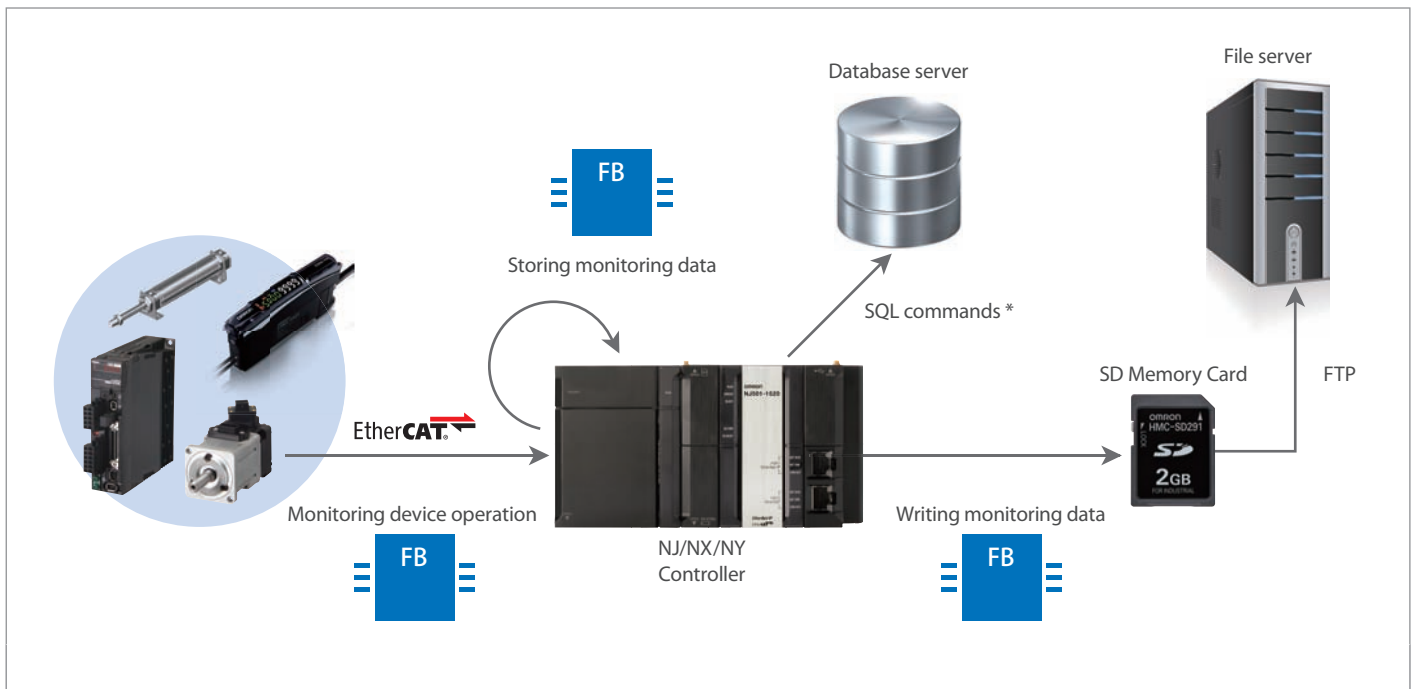
**Point 1** The Omron's NA/NS Programmable Terminal shows the monitoring data in tables and graphs. This makes predictive maintenance easier.

Initial display

Trend graph

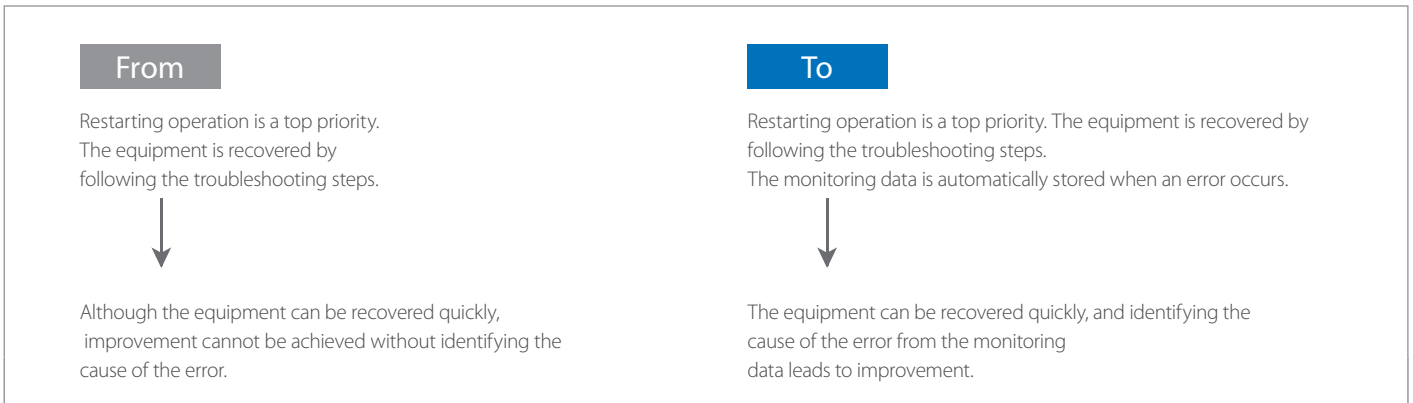
A variety of screen samples are available. Ask your Omron sales representative for details.

**Point 2** You can easily store the monitoring data and save it as a CSV file on an SD memory card by using the Function Blocks in this library. The saved data can be transferred to the host via Ethernet.

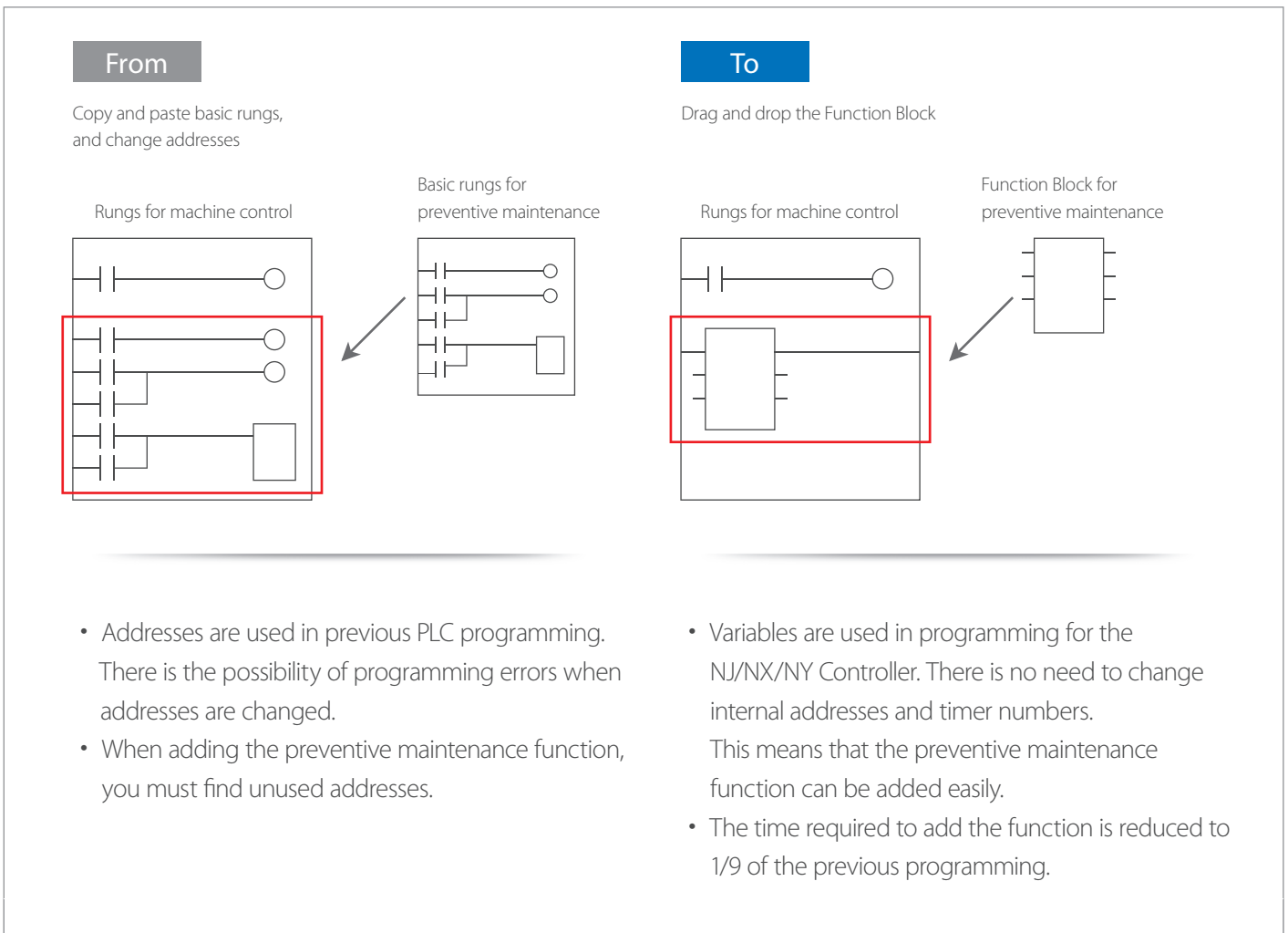


\* The NJ Database Connection CPU Unit can directly access SQL Database on a server.

**Point 3** When an error occurs, the monitoring data stored on the SD memory card can be used to identify the cause of the error even after the restart of the equipment.



**Point 4** This library allows preventive maintenance to be implemented easily and quickly.



## Compatible Models

Name	Model	Version
Machine Automation Controller NJ/NX CPU Unit	NX701-□□□□/ NJ101-□□□□	Version 1.10 or later
	NJ501-□□□□/ NJ301-□□□□	Version 1.01 or later
	NX1P2-□□□□□□(1)	Version 1.13 or later
Industrial PC Platform NY IPC Machine Controller	NY5□□-1	Version 1.12 or later
Automation Software Sysmac Studio	SYSMAC-SE2□□□	Version 1.14 or higher
G5 Servo Drive with Built-in EtherCAT Communications	R88D-KN□□□-ECT	Version 2.10 or later
Sensor Communications Unit (EtherCAT)	E3NW-ECT	Version 1.03 or later
Distributed Sensor Unit	E3NW-DS	—
Smart Laser Amplifier Unit	E3NC-LA0	—
Smart Laser Amplifier Unit (CMOS type)	E3NC-SA0	—
Smart Fiber Amplifier Unit	E3NX-FA0	—
Contact-Type Smart Amplifier Unit	E3NC-TA0	—
SD Memory Card	HMC-SD□□□	—

## Function Block (FB)/Function (FUN) Specifications

Name	FB/FUN name	Description
Monitor Cylinder Device Operation (Measure)	MonitorCylinder_Measure	Measures the operation time of the cylinder and outputs the average value of the 10 most recent times.
Monitor Cylinder Device Operation (Double)	MonitorCylinder_Double	Measures the operation time of the cylinder and outputs an alarm and error if the operation time exceeds the set upper or lower limit. Push and pull command signals are used.
Monitor Cylinder Device Operation (Single)	MonitorCylinder_Single	Measures the operation time of the cylinder and outputs an alarm and error if the operation time exceeds the set upper or lower limit. Only the push command is used.
Logging Compare	LogCompare	Logs measurement values and compares them with the logged master values.
Display Log Data	LogDataToGraph	Converts log data that was acquired with the LogCompare Function Block to the data format that is suitable for displaying as a broken-line graph on the NS Programmable Terminal.
Write Log Data to SD Memory Card	LogDataCSVWrite	Writes the log data that is acquired with the LogCompare Function Block to an SD memory card in CSV format.
Read Log Data to SD Memory Card	LogDataCSVRead	Reads the log data that is used with the LogCompare Function Block from an SD memory card.
Monitor Photoelectric Sensor Device Operation	MonitorLightSensor	Monitors the amount of light received by the through-beam photoelectric sensor and outputs an alarm when the amount of light received is low.
Measure Cycle Time	Stopwatch	Outputs the time from when measurement starts until measurement ends.
Add Data Record	DataRecorderPut	Adds data records to the data recorder.
Get Data Record	DataRecorderGet	Reads the oldest data record that is stored in the data recorder.
Write from Data Recorder to SD Memory Card	DataRecorderCSVWrite	Writes the data records that are stored in the data recorder to an SD memory card in CSV format.
Add Axis Record	AxisRecorderPut	Adds axis records to the axis recorder.
Get Axis Record	AxisRecorderGet	Reads the oldest axis record that is stored in the axis recorder.
Write Axis Record to SD Memory Card	AxisRecorderCSVWrite	Writes the axis records that are stored in the axis recorder to an SD memory card in CSV format.
Add Bit Record	BitRecorderPut	Adds bit records to the bit recorder.
Get Bit Record	BitRecorderGet	Reads the oldest bit record that is stored in the bit recorder.
Display Bit Record	BitRecorderToGraph	Converts bit records that are stored in the bit recorder to the data format that is suitable for time chart displays that use the broken-line graph function of the NS Programmable Terminal.

Sysmac is a trademark or registered trademark of OMRON Corporation in Japan and other countries for OMRON factory automation products. EtherCAT® is registered trademark and patented technology, licensed by Beckhoff Automation GmbH, Germany. EtherNet/IP™ is a trademark of the ODVA. Other company names and product names in this document are the trademarks or registered trademarks of their respective companies.

Note: Do not use this document to operate the Unit.

**OMRON Corporation Industrial Automation Company**  
Kyoto, JAPAN

Contact: [www.ia.omron.com](http://www.ia.omron.com)

**Regional Headquarters**

**OMRON EUROPE B.V.**

Wegalaan 67-69, 2132 JD Hoofddorp  
The Netherlands  
Tel: (31)2356-81-300/Fax: (31)2356-81-388

**OMRON ELECTRONICS LLC**

2895 Greenspoint Parkway, Suite 200  
Hoffman Estates, IL 60169 U.S.A.  
Tel: (1) 847-843-7900/Fax: (1) 847-843-7787

**OMRON ASIA PACIFIC PTE. LTD.**

No. 438A Alexandra Road # 05-05/08 (Lobby 2),  
Alexandra Technopark,  
Singapore 119967  
Tel: (65) 6835-3011/Fax: (65) 6835-2711

**OMRON (CHINA) CO., LTD.**

Room 2211, Bank of China Tower,  
200 Yin Cheng Zhong Road,  
PuDong New Area, Shanghai, 200120, China  
Tel: (86) 21-5037-2222/Fax: (86) 21-5037-2200

**Authorized Distributor:**

© OMRON Corporation 2015 All Rights Reserved.  
In the interest of product improvement,  
specifications are subject to change without notice.

**CSM\_2\_1\_1116**  
**Cat. No. P101-E1-01**

1115(1115)